DOCUMENT RESUME

ED 449 993 SE 064 566

TITLE	Accelerated Math[R]: Pilot Schools Report. A School Renaissance Institute Monograph.
INSTITUTION	School Renaissance Inst., Inc., Madison, WI.
PUB DATE	2000-00-00
NOTE	15p.
AVAILABLE FROM	School Renaissance Institute, P.O. Box 45016, Madison, WI 53744-5016; Tel: 800-200-4848 (Toll Free).
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Computer Managed Instruction; Computer Software; *Computer Uses in Education; Elementary Secondary Education; *Mathematics Instruction; *Teaching Methods

ABSTRACT

Accelerated Math (AM) math management software is a task level learning information system placed in 4th-11th grade classrooms around the country. AM provides teachers with an information system that assures that students can master all math objectives and state standards from grade 3 through calculus. It eliminates teacher paperwork, improves student motivation, and frees teachers to work individually with each student. AM supports all textbooks and instructional methods. This report is divided into sections that include an AM overview; math classroom ecology; design goals and a description of AM; pilot school project description; teacher, student, and patent surveys; test results; and discussion and conclusion. (ASK)

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ACCELERATED MATH®

Pilot Schools Report

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ACCELERATED MATH
PILOT SCHOOLS
REPORT

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Introduction

The external publication of this report on the Accelerated Math (AM) pilot school project was unanticipated. Originally, we expected to do an internal report only. When the AM pilot software program was placed in the 4–11th grade classrooms around the country, our objectives were limited to completing the software design, debugging, and learning how teachers would integrate the software into their classrooms. What caused us to decide to publish this report externally is that AM, even in its pilot state, worked better than we thought possible.

Accelerated Math math management software is a task-level learning information system. The objective of AM is to provide teachers with an information system that assures students can master all math objectives and state standards from grade three through calculus. It eliminates teacher paperwork, improves student motivation, and frees teachers to work individually with each student. AM supports all textbooks and instructional methods.

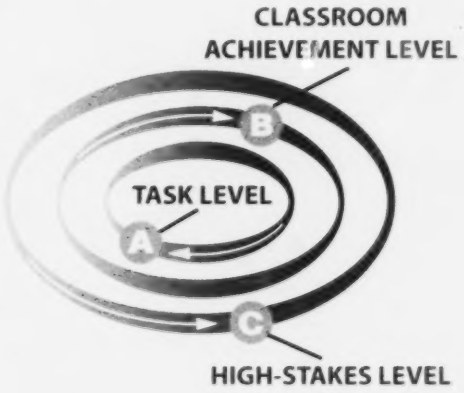
This report is divided into the following sections: AM overview; math classroom ecology; design goals and description of AM; pilot school project description; teacher, student, and parent surveys; test results; and discussion and conclusion.

Accelerated Math Overview

AM is a direct corollary of the Accelerated Reader computerized reading management program (AR). AR is the leading reading software product in U. S. schools and is currently used in over 53,000 schools nationwide. Both AM and AR are task-level learning information systems.

Task-level learning information systems are the most important of the three levels of interrelated and linked school learning information systems. The other two levels, classroom achievement and district and state accountability systems (high-stakes level), while essential, do not have the impact on learning that the task-level system does. This is because the task-level system provides by far the most information; it provides daily and, in some cases, hourly feedback information to teachers and students.

Levels of Learning Information Systems



The task that AR helps teachers manage is student book reading. AM, on the other hand, helps teachers manage the daily task of student practice and mastery of math objectives. Both AR and the Institute's teacher training course, Reading Renaissance, are the historical precedents to AM. Reading Renaissance training is organized around the four topics that we believe are the key to accelerating learning in any classroom. The four topics are: time on appropriate tasks, information, motivation, and teachers. The same four topics are equally important to understanding the design of AM and provide a framework for understanding the ecology of a math classroom.

The Ecology of Math Classrooms

Anyone who has studied the ecology of a math classroom in elementary or secondary schools knows that students spend much more time off task than on. There is a tremendous amount of student time involved in time-consuming paperwork, and copying and correcting problems. There is a tremendous amount of paperwork for math teachers also. Yet even with all the time spent on paperwork and record keeping, there is still inadequate information available to know what objectives each student has mastered. Faced with 15 to 35 students, this lack of information forces teachers to teach to the middle. The result is that at any one time, only about a third of the students are working on math objectives in their zone of proximal development, math objectives which are new and challenging, but not frustrating. The lower third is lost, unsuccessful, and frustrated. The upper third is under-challenged and bored. There is a lot of cooperative learning, but it is of the wrong type. Students either divide up the assigned problems and share the answers or copy all the answers from the better students. This also negatively impacts motivation. Homework in many cases exacerbates the problem. The effect of homework is to allow students with a supportive home environment to race ahead while disadvantaged students fall further and further behind. Just as in reading, where the top 5 percent of students read 144 times more than the lowest 5 percent, the good math students work a lot more math problems than the lower-achieving students who simply get turned off to math and stop working altogether. The rich get richer and the poor get poorer. And at the heart of the problem is a fundamental lack of information for students, parents, and especially teachers. It is the lack of information that leads to insufficient time on appropriate tasks, low motivation, and overworked and overwhelmed teachers unable to provide individualized attention. In summary, the Reading Renaissance framework of time on appropriate tasks, information, motivation, and teaching applies equally to math as it does to reading. And at the center of the problem is inadequate information. Inadequate information is the problem addressed by AM.

Design Goals and Description of AM

The ambitious design goals of AM are to provide a task-level learning information system which: a) provides sufficient information to allow teachers to individualize math instruction; b) eliminates all unnecessary paperwork for students and teachers; c) supports and enhances a cooperative learning environment in mixed ability classrooms; d) supports NCTM standards, all textbooks, and teaching methods for third-grade math through calculus; e) dramatically increases time on appropriate tasks; and f) provides the capability to report on mastery of state and district standards.

To achieve these design goals requires a program capable of generating problem sets for practice and testing unique for each individual student. It also requires that all items be linked to objectives that in turn can be linked to state and district standards. The result of almost five years of effort is the Accelerated Math computerized math management program with the following elements:

1. Algorithm problem generator for creating an unlimited number of unique, individualized practice and test problems that can be optionally linked to the chosen textbook and state or district standards.

2. Computer scoring of all assisted response/multiple choice problem sets. Rubric scoring of extended response higher-order problem sets.

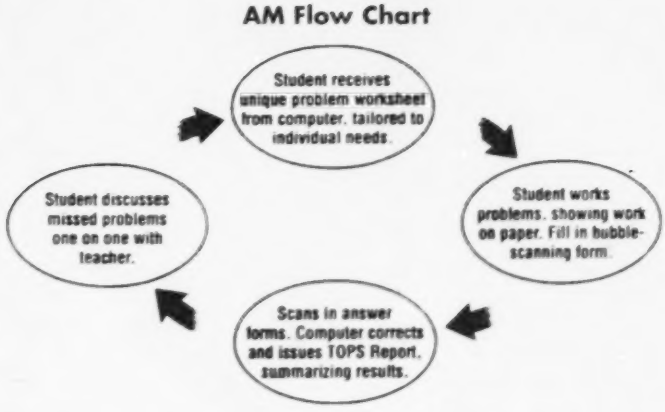
3. Objective tracking and automatic propagation of problems. This provides for the automatic administration of problems within each student's individual zone of proximal development for practice or mastery testing and the ability to report by objective so teachers, students, and parents always know what objective students have accomplished and which they are still working on. Teachers can always override the computer to exactly control the administration of objectives.

4. A powerful print and display engine that can handle all problem types.

5. Multiple libraries of problems to support all curriculums and all textbooks from third grade through calculus, including both assisted response/multiple choice, free response, and rubric-scored application and higher-order extended-response problems.

6. Immediately available student and class diagnostic reports showing which objectives students know and don't know to provide teachers with the information needed to intervene and adjust instruction to the student's individual needs.

The daily practice flow chart for AM is as follows:


AM Flow Chart
Student receives unique problem worksheet from computer, tailored to individual needs.
Student works problems, showing work on paper. Fill in bubble-scanning form.
Scans in answer forms. Computer corrects and issues TOPS Report, summarizing results.
Student discusses missed problems one on one with teacher.

The computer tracks all student work and alerts the teacher to the objectives for which the students are ready to test. Once a week, or as often as required, teachers print out a test worksheet for students to complete under monitored conditions. If students achieve 80 to 90 percent correct on the mastery test, the objective is considered mastered. Mastered objectives continue to re-appear on practice work sheets, but at a reduced rate.

Four sample reports from Accelerated Math are shown in Appendix A.

Pilot School Project Description

Accelerated Math pilot software was installed in nine locations beginning in September 1997. The pilot studies extended through the 1997–98 school year, although not all of the pilot teachers used AM for the full year. There were also various levels of implementation. All pilots were furnished with software, appropriate grade level libraries of math problems, one computer per classroom, a laser printer, a scanner, and supplies. One day of training was given. Additional support was provided by phone and through periodic visits from company personnel. Implementation and use was initially slowed until the major software bugs and design issues were resolved.

Each pilot teacher decided independently how to integrate AM into his or her classroom. Some continued to use a mixed system, retaining their traditional methods and using AM to supplement. Others adopted AM as their primary management tool. Teachers typically continued to use textbooks and supplemental materials for instructional resources. (AM does not replace instruction or the need for instructional materials.)

Below is a list of the pilot classrooms, showing the state, grade level, math problem library used, and level of implementation as measured by objectives mastered per student.

Pilot #	State	Grade	Students	Math Problem Library	Implementation Level (Objectives Mastered/Student in Spring Semester)
1	WI	5	24	5	85
2	WI	4	23	4	78
3	WI	6	25	6	102
4	WI	6	65	6	60
5	OH	4	25	4	54
6	VA	4–5	40	4–6	149
7	TX	4	28	4–5	42
8	WA	10–12	60	Algebra	47
9	WA	11–12	180	Basic Math	50

Teacher Survey

The pilot classroom teachers completed a survey form with the questions shown below. Not all teachers completed all questions. The number of teachers agreeing to each answer is shown in parenthesis, and the scaled score is shown after "don't know." The scaled score is calculated based on 4-strongly agree, 3-agree, 2-disagree, and 1-strongly disagree. A "don't know" was not included in the scaled score calculations.

Teacher Survey Questions & Summary

1 My students are learning basic math skills better this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	Scaled Score
(4)	(5)	(0)	(0)	(0)	3.4

2 My students are learning higher-order thinking and problem-solving skills better this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(3)	(4)	(0)	(0)	(3)	3.4

3 My students are progressing through math topics faster this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(3)	(5)	(2)	(0)	(0)	3.1

4 My students are more confident in math this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(4)	(4)	(0)	(0)	(1)	3.5

5 My students enjoy math more this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(3)	(4)	(1)	(0)	(2)	3.3

6 My students are more motivated to work at math this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(4)	(6)	(0)	(0)	(0)	3.4

7 My students take more responsibility for their math work this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(7)	(2)	(0)	(0)	(1)	3.8

8 My students spend more time doing math this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(5)	(5)	(0)	(0)	(0)	3.5

9 My students' math time is more productive this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(6)	(2)	(1)	(0)	(0)	3.6

10 My students are helping each other more and working more cooperatively this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(6)	(2)	(1)	(0)	(1)	3.6

11 I have fewer discipline problems in math class this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(3)	(2)	(2)	(1)	(1)	2.9

12 I am better able to deal with my students' different ability levels this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(8)	(1)	(0)	(0)	(0)	3.9

13 I am better able to diagnose and correct individual student difficulties this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(8)	(2)	(0)	(0)	(0)	3.8

14 The information provided by Accelerated Math enables me to teach more effectively than in previous years.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	Scaled Score
(5)	(3)	(0)	(0)	(1)	3.6

15 I spend less time grading papers and keeping records this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(5)	(2)	(2)	(0)	(1)	3.3

16 I spend more time teaching and helping individual students this year.

Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	
(6)	(3)	(1)	(0)	(0)	3.5

Overall the teacher survey results are quite positive. Teachers highly agreed with most statements. With AM, teachers feel students learn more basic and higher-order skills, are more confident and motivated, and take more responsibility for their work. Teachers also highly agreed that AM helped them diagnose and intervene and deal with individual students of varying ability.

Student Survey

The following student survey tables summarize results from four 4th-grade, three 5th-grade, and two 6th-grade pilot classrooms: seven teachers, nine classrooms, and 152 students. Controlled student data are from five classrooms (110 students) in the same schools who did not use AM. All survey questions were phrased so that an "Agree" or "Yes" answer is a favorable response.

Student Survey Summary

Question	AM (152 students) Agrees	Control (110 students) Agrees
1 I like math.	89%	80%
2 I think I am good at math.	85%	78%
3 I learned more math this year than last year.	95%	93%
4 I spent more time on math this year than last year.	90%	80%
5 I like math better this year than last year.	85%	No control
6 It was easy to learn how to use the computer.	96%	No control
7 I learn math better with a computer instead of only with a book.	87%	No control
8 I feel confident that I can pass the tests that the computer gives me.	97%	No control

In addition to this student survey, the two pilot classroom teachers for the combined 4th-5th grade class in Virginia gave their students an assignment to write about their Accelerated Math experience. The students were asked to respond to how they felt about math the previous year versus this year with AM and what they would recommend be changed or improved in the AM program. (FYI–The students called the computer running the AM program "Cosmo.") A sample of responses with student name deleted is shown in Appendix B, "What Students Say About the Accelerated Math" on pages 10 through 12.

Parent Survey

Following is a summary of the parent survey results:

AM Parent Survey Summary
(119 Parents)

Question	Yes	No	Same	Don't Know
1 My child likes math more this year than last year.	70%	3%	27%	0%
2 My child is learning math better this year compared to last year.	67%	9%	19%	5%
3 My child is more confident in math this year compared to last year.	62%	8%	29%	1%
4 My child is more motivated to work on math this year compared to last year.	65%	8%	25%	2%

Testing

As was explained in the introduction, we did not plan to do the traditional pre- and post-test with control for the AM pilot studies because the focus was to get the bugs out of the software and do a comprehensive study as the next stage. It was not until we were in the middle of the study when it was clear that the AM version was having a very positive impact that we decided to gather test information. We were only able to collect pre- and post-test information with a control for one pilot classroom. The test data we have is for the Virginia classroom that is a mixed 4th and 5th grade class of 40 students that is team-taught by two teachers. This classroom is also a Reading Renaissance classroom using Accelerated Reader in which the students read books 60 minutes per day in school. These teachers did an excellent job of AM implementation and their students achieved by far the highest number of objectives mastered per day. Objectives mastered per day are like a math classroom speedometer. It directly correlates to time on task. Students in the Virginia class were given around 60 minutes per day to work on math. Most of the other pilot classrooms ranged between 20 to 45 minutes per day.

The standardized norm-referenced test used for the post-test is our STAR Math computer-adaptive test. There was no pretest available for the 5th-graders. The pretest for the 4th-graders was their 3rd-grade spring Stanford 9. Percentile scores were converted to NCE for averaging and then reconverted to percentiles.

Test Summary Virginia Pilot

	AM (26 students)			Control (25 students)		
	Pretest Percentile (Stan. 9)	Post-Test Percentile (STAR)	Change	Pretest Percentile (Stan. 9)	Post-Test Percentile (STAR)	Change
Fourth Grade	56	95	+39	36	34	-2

	AM (14 students)	Control (24 students)
	Post-Test Percentile (STAR)	Post-Test Percentile (STAR)
Fifth Grade	95	67

Discussion of Results and Conclusion

The teacher, student, and parent survey results are all quite positive and consistent. The survey results are also consistent with our observations when visiting pilot classrooms. Even though the AM program had numerous bugs and ran slowly in all classrooms, students were on task more, seemed more motivated, and were mastering objectives faster than control classes. Teachers were able to work one-on-one with students and knew when a student was struggling, and were able to immediately intervene. The test results in the Virginia classroom, an average gain of 39 percentile for the 4th-graders, with 4th- and 5th-graders finishing at the +90th percentile, is truly extraordinary. These are some of the highest gains and highest ending percentile scores we have ever seen in either math or reading. Based on STAR Math grade-equivalent norms, the gains approximate to an average of two years growth in one year. The test scores are so extraordinary, in fact, that one would be remiss in not giving a caveat. These results may not be representative of what all teachers can achieve. Most math periods are less than 60 minutes long. We do not know how much Accelerated Reader and Reading Renaissance may have contributed to these gains. Different tests were used for the pre- and post-test. Clearly the control was not well matched in the 4th grade because the control students average pretest achievement score in math at the 35th percentile, which was considerable lower than the AM students at the 56th percentile. (Although, typically one will generally be able to achieve higher gains with lower versus higher achieving students.) In order to know with a high degree of certainty the expected gains possible with Accelerated Math, larger and better-controlled studies will be required.

Still, having given the above caveat, the results of this study are highly encouraging. We look forward to having AM studied by independent researchers while continuing to move forward with our own.

Related Works from School Renaissance Institute

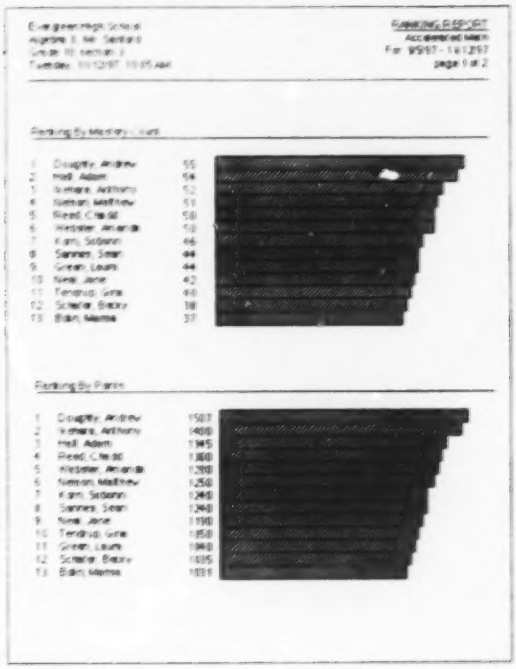
Learning Information Systems: Theoretical Foundations

ZPD Guidelines: Helping Students Achieve Optimum Reading Growth

Patterns of Reading Practice

Fundamentals of Reading Renaissance

Appendix A: Accelerated Math Sample Reports



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Appendix B: What Students Say About Accelerated Math

All About Good Math

Last year math was easy because I knew how to do it. We did a lot of addition and subtracting and I knew a lot because my teacher would show flash cards. We also did our work in a math book.

Now we have no math out of a math book because we have a computer called Cosmo. In math we do dividing and times tables. We do so much math. We do it for home work. Now I am in dividing and it is very easy for me. Mr. Lind has a helper Mrs. Lubas. They help us with work sheets. We have math tests and we have objectives that we pass.

When I grow up I will be a teacher because I will know a lot. One day I will give a good thank you to my best teachers, Mrs. Lubas and Mr. Lind.

Accelerated Math

Last year I hated math. It was no fun. We had to copy it out of a book. I didn't like the math I had either.

Math rules this year, now that we've got Cozmo. Cozmo is a computer. He is the best computer in the world! I am learning a lot from Cozmo. He gives me lots of problems that I didn't get last year. Sometimes Cozmo makes mistakes but that's o.k., because we fix them.

Next year I'm going to fifth grade. If we don't have the videotape that helps teach math then I'm going to love math.

Cosmo

In third grade we had to copy problems out of the math book. The only thing I liked in third grade math was when we had worksheets copied from a math book.

Math is now easier because there is no copying out of the math book. Computer math is really fun. It's not as hard as third grade math. The thing I don't like is when I spend a half hour on one computer mistake.

I think that everybody would like it if the computer would talk and say good job or nice try. Everything else is OK!

Accelerated Math

Last year I hated math. I didn't get to move at my own pace. If you didn't know how to do the work then the class had to wait for you. If someone else didn't know something then you had to wait for them, so everyone was bored.

This year we have Accelerated Math. You get to move at your own pace, computer and scanner. Unlike last year if you miss something the teacher goes over it with you. You don't get embarrassed by having to do problems on the board or in front of people.

I think they could make Cosmo better by making him talk. If you get a 100 percent then a Jet could come across the screen with a banner saying, congratulations you got a hundred percent.

Accelerated Math

Math last year was boring. We had to wait for others to catch up on long division or other things. It was really slow. We had to write all the problems over and over again until everyone mastered it. I'm glad we have Accelerated Math this year.

Accelerated Math goes a whole lot faster then last year. We still have to write the problems on paper but we can go at our own pace. We use a computer. We named the computer Cosmo. Some people are all ready in the 6th grade. I like tests best because if you get a 100% you get a piece of candy or a nice treat.

Next year I am going to middle school and I'll have to go back to writing all the problems on paper over and over again. I will miss Cosmo.

Basic Math

I used to hate math because we had to write our work out of a book. The only thing I liked in math was it only lasted half an hour or longer. After math my fingers hurt, but not bad!

I have passed a lot of objectives and I am in geometry. I like math more this year than last year. I don't like math much this year because we have it for an hour! There is another reason I like math this year, it is because most of the math is easy. If you get one wrong your teacher will go over it with you so you don't get it wrong again.

Next year I hope we have a math computer like this one. I hope it gets harder and I get up to seventh grade or farther.

Accelerated Math

Before Accelerated Math I had to do all of my math with the class, and I couldn't go ahead. I had to wait until the whole class got the hang of it. It stunk! Math was a nightmare. There was also a heavy book. When you didn't know something you worried about being called on to go up to the board.

In fourth grade I started Accelerated Math. Finally I could go at my own pace. I didn't have to learn things I already knew how to do. For the first time ever I liked math! I finished my worksheet then I filled out my scan sheet then I scan it through the machine. If I miss any the teacher goes over them and signs my paper. If I don't miss any the teacher signs it and says "good job!"

I think it could be better if there where no double answers. I also think it would be better if it had graphics, and a little man runs across the screen saying perfect. That's how I think it can be better. But no matter what it's better than carrying a ten pound book home everyday.

Math

Before my class had Accelerated Math we did math out of a book. It was really boring. I couldn't go at my own pace. I had to wait until everybody understood what the teacher was teaching. I didn't like it when you had to go up to the board and write the problem when you didn't know how to do it.

With AM you can go at your own pace. When I have a problem I just go up to the teacher and ask. I like AM better then doing math in a book. It's harder to copy long problems on paper from the book. We have to show all our work with our practice sheets but it is still easier.

I think to make the program better you could have it say "good job" when you do good on a worksheet.

Accelerated Math

Last year math was very boring. Everybody was doing the same thing. If someone knew how to do the lesson they were working on, that person couldn't go on. You usually had to do the work from the book and copy it on a piece of paper, which took a long time. If you weren't done you had to stay in for break to finish.

Appendix B: What Students Say About Accelerated Math *(continued)*

Accelerated Math is fun, fast, and easy. You don't have to wait a week for the teacher to grade your homework, class work, and tests. The computer grades it in just a few seconds. You can work at your own pace, and it doesn't matter what you get on your practice sheet, you only get graded on tests.

Still there are things I don't like about Accelerated Math. Sometimes there are double answers, and scan sheet errors, and other mistakes that are frustrating. I'm glad that we have Accelerated Math, because otherwise we would probably still be doing fractions. With Accelerated Math I'm already done with 5th grade, and working on 6th grade math. I hope that in the future everybody will have Accelerated Math.

Accelerated Math

Before, math was different. Last year's math was boring and scary because you had to do your problems in front of other people. When your teacher told you to do a math problem, out loud or on the blackboard you were embarrassed and frightened. Sometimes your teacher would be a little angry with you, too.

Thanks to AM, this year we don't have to worry anymore. We are moving at our own rate everyday now. AM is easy. First you need to work on your practice sheet you get from the computer. When you are finished the only thing you do is scan your scan sheet. After you scan it you see if you missed any problems. If you did then you go over to the teacher and he or she goes over the problems you missed so you understand what you missed. If you finish the 5th grade math you get a certificate. If you get a perfect on your test you get a piece of candy.

It would be much cooler if AM could talk back. It could tell you what you miss and explain it to you so you understand the problems better. This way the teacher wouldn't have to explain it to you and go over everything. It would be nice if AM could sign your papers, too.

Accelerated Math

Third grade math wasn't even half as good as this years' math is. For one thing you didn't get to go at your own pace and if anybody went slow the whole class would have to do it again. Also the teacher would have to check all the papers and sometimes she would mess up and give you a bad grade. We usually had to copy out of our books and sometimes we would do the wrong problem or the whole wrong section. I think the only good thing about math last year was Thursday when we didn't have math.

This year math is much better. I actually look forward to doing it every morning. I like AM because you don't have to wait for everybody when you're ahead. It's also good because the scanner can check it in about two seconds and it checks it right, too. I don't think there is anything that I don't like about AM.

I hope that by the time I get to middle school they have AM, because I can't stand math when we have to use the book.

Math

Last year Math was hard. You had to have a piece of notebook paper and a math book and you work your head off trying to think of fractions, table of measures, and times tables. It was hard.

This year it is easier then last year. I can get a piece of candy if I get all my problems right. We get objectives on math tests. I think they should put a rolling ball on the screen up really close to you. If you get some of your problems right it will say "close." And if you get all your problems right it will say "Drats," not one is wrong.

Now I'm at 82 objectives. I'm still behind but I'll get caught up. I think it will be a long time. But I'm still glad we have Accelerated Math.

Differences in Math

Last year in third grade math I always stayed in for break because I never could finish my math on time. I always had to write down math problems. I also never got higher than a c+ on my report card for math. I never really liked math.

Now in 4th grade math it's much more fun and easier. You don't have to write down problems and all you do is circle A, B, C, or D. On Accelerated Math you learn math instead of just getting a paper back. I especially like math because you can go at your own pace. The only thing I don't like about math is that you have to fill in a scan sheet.

In the future I hope that the computer talks and says Excellent, you got 100%.

All About Math

Last year in math we had to write the problems on a piece of paper. I didn't like it because it made my arm hurt. I got all the problems wrong.

I like math now because you can go at your own speed and you can take your time. Math is better now because you don't have to write it on a separate piece of paper. In the third group I'm in first place. I've mastered 49 objectives. I have 125.22 points in math. Sometimes when I get a math test I get 100% on it. You get to do fractions and they are fun to do.

I would like it if in the year 2000 the computer could talk to us. Maybe it would be neat if it said, "Way to go. You answered all correctly."

Math 2000

Last year in 3rd grade I had to write my problems and I felt bad writing them. We did adding, division, subtract, multiplying, etc. I liked Fractions the best. The bad thing about math was division. I didn't like that because I didn't know how to divide.

I like math now because you don't have to write down the problems. The bad thing is that long division is hard, but it's easy now. I'm on my 86th objective in math.

The thing that will make Accelerated Math better is to make it talk. If you get it all wrong it will say "sorry" but if you get it all right it will say "nice job."

Accelerated Math

Last year in third grade we used textbooks to do all our work. I hate textbooks, especially if the textbooks are for math. You had to write everything down and even though I was good in math I still handed in my work after everybody else because my hands got tired easily.

Now in forth grade, we have AM (Accelerated Math). It's so cool! I'm already doing sixth grade math! That's because I can move at my one speed. This is how it works:

First, you finish your multiple choice problems. Then, you fill out a scan sheet. Then you go to the computer and pick your

Appendix B: What Students Say About Accelerated Math *(continued)*

name out of a list of your classmate's names. You enter your password and a screen will show up. You click on the word score and then you put your scan sheet in the scanner. It scans your paper.

Now you have to run off your new worksheet. You select your name and put in your password again and the screen shows up again. This time you have to pick what size you want your worksheet to be. You click either small, medium, or large. Then you click and print. That completes the process of AM and then you start over again. I'm glad it's this way because it's a lot better than the old way.

I Love Math

Math last year hurt my hand because we had to copy down problems all the time. I hated math last year.

This year in math I like everything, especially that we can go at our own pace. I like math because I like going on Cosmo. The only thing I don't like is that we have to fill in a scan sheet for every work sheet we finish. I also don't like how our work sheet takes so long to print out.

Next year I hope I can do high school math. I think that Cosmo should talk. When we get problems all right it should say great, and when we get some wrong it should say nice try.

Accelerated Math

Last year before we had Accelerated Math everything was so hard. We had to work together in groups and we could not work at our own pace. If one person mastered something they had to keep working on it until everybody mastered it. If there was something we didn't know how to do and we got called to the board to do one of the problems we'd be very embarrassed!

This year we have Accelerated Math, so we can work at our own pace, work on what we know how to do, and only take a test when we are ready! I think that math is fun now! If someone isn't working on what another person is working on it doesn't mean they aren't smart, it just means that they aren't ready for that subject. Another good thing is when you finish a grade in math, for example graduate from fifth grade math, you get a really nice award. Everyone claps for you and is proud of you. It really makes you feel good about yourself.

I think what would make AM better would be if it could talk. If someone got 100% on a worksheet the computer could say, "Congratulations you have gotten 100% on your math worksheet, you will receive full credit for it!" But talk or no talk I still think AM is cool!

Cosmo

Last year we did math in a math book, worksheets, and paper. When we missed a problem our teacher never went over what we missed. I mostly missed division and multiplication, and I hated it!

This year I like math because no one can copy you and you can go at your own pace. When you finish a worksheet we fill in a scan sheet and put it through a scanner. The screen shows us how many we missed, then we go to a teacher go over the ones we missed. When we need help we go to a teacher, but last year we couldn't go to a teacher and get help.

Next year I hope I get to 7th grade math. I hope Accelerated Math talks and that I can do work on the computer.

Math

Before Accelerated Math in our class, we would get a sheet of paper and if we didn't understand it tough luck! Teachers would never go over what you missed so you never understood it. You couldn't ask for help because the teachers were always too busy with other things. Now with Accelerated Math it changed my grade from a D to well a D but I'm starting to get it better. Now we are doing high school math! Accelerated Math has made S.O.A.R. A the highest group in America! What next Accelerated Science!

The one thing that could make it better is to be able to work on two worksheets at a time. One could be a classwork sheet and the other could be a homework sheet.

Math... Accelerated Math

When I was in fourth grade, we did math the old way. We sat down, did the same math, read out of the same book. Everyone got scared when we had to go up to the chalkboard to do the problem.

We don't do that anymore. I'm in fifth grade, and we have Accelerated Math. When you use A Math, you get a worksheet through the printer, work on it, write the answers on your scan sheet, then scan it. When you find out what your score is, you take it to the teacher and she will correct you and teach you what you did wrong. I like A Math because you get to go at your own pace, you get to learn lots of new math, and because you get a piece of candy if you get 100% on your test.

The things don't like about A Math are double answers, the scan sheet errors, and the computer errors. Besides the problems, A Math is a fun, and easy way to do math. And I hope everyone will be able to do A Math someday.

Accelerated Math

Math before Accelerated Math. Sometimes when you had to go up to the board and work out a problem you did not know how to do, you would get so humiliated. Also, math was boring because you had to do everything out of a book. Even if you already know how to do it you ended up sitting there for five minutes waiting for the other people to get one.

This year we were surprised when we found out that we were going to do our math on a computer. At first I started to worry because everyone would be doing the same thing, but in a couple of days I started to like it. By the second week I loved this new program. You can move at your own speed so you know how to do everything. Now you can move on instead of just sitting there waiting for other people. I wish that schools all around the world could have AM so they could have the experiences we do.

Accelerated Math is a cool program. I wish that I could do it forever but I'm afraid I can't because next year I'm going to middle school. I'll be back to the books. I'm really going to miss this program, but you never know, in a year or two even middle schools might have AM, too. If they do I'll be glad.

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